

Claims

What is claimed is

1. A method of the chemical metal organic vapor epitaxy for the multiple-chamber epitaxy layer deposition is used in the epitaxy of LED process, comprising the steps of:

providing multiple chambers, and each of said chambers are with its individual reaction condition;

forming multiple substrates, and said substrates being in different chambers;

forming an epitaxy layer, and said epitaxy layer being on said substrate;

removing said substrate to the P-type chamber, and the second substrate being put into said multiple chambers for forming the epitaxy layer of the second substrate; and

forming a second epitaxy layer, said second epitaxy layer being on the said first epitaxy layer, and said substrate being removed from said P-type chamber after one reaction period, then, the second substrate being put into said P-type chamber for forming the second epitaxy layer of the second substrate, and said first epitaxy layer being implemented by multiple in-out processes in the chambers, Further, the reaction time of each chamber being the growth time for the second epitaxy layer.

2. The method of the chemical metal organic vapor epitaxy for the multi-chamber epitaxy layer deposition

according to claim 1, wherein the time of the first epitaxy layer for passing through said multiple chambers is equal to the required reaction time of said first epitaxy layer divide to the required reaction time of said second epitaxy layer, more, it uses the integral of the number.

3. The method of the chemical metal organic vapor epitaxy for the multi-chamber epitaxy layer deposition according to claim 1, wherein said reaction time can be one hour.

4. The method of the chemical metal organic vapor epitaxy for the multi-chamber epitaxy layer deposition according to claim 1, wherein the said first epitaxy layer can be a N-type epitaxy layer.

5. The method of the chemical metal organic vapor epitaxy for the multi-chamber epitaxy layer deposition according to claim 1, wherein said second epitaxy layer can be a P-type epitaxy layer.

6. The method of the chemical metal organic vapor epitaxy for the multi-chamber epitaxy layer deposition according to claim 1, wherein the reaction condition of said chamber includes a carrier gas, a precursor, and a tolerated temperature.

7. The method of the chemical metal organic vapor epitaxy for the multi-chamber epitaxy layer deposition according to claim 1, wherein said carrier gas can be

H, and said precursor can be one of BC13 and PC13, BC13 and PH13, and NH3.

8. A method of the chemical metal organic vapor epitaxy for the multi-chamber epitaxy layer deposition is used in the epitaxy of LED process, comprising the steps of:
5 providing at least five chambers, each of said chambers has its individual reaction condition;

forming multiple substrates, the first substrate being put into the first chamber;

10 forming the first type of the first epitaxy layer, said first type of the first epitaxy layer being on said substrate, and after passing one period of reaction time, the substrate being removed from the said first chamber, and put into the second chamber, and also, the second
15 substrate being removed to said first chamber;

forming the second type of the first epitaxy layer, said second type of the first epitaxy layer being on said first type of the first epitaxy layer, and after passing said reaction time, said substrate being removed from said
20 second chamber, and then put into the third chamber, and then, the second substrate being removed to said second chamber;

forming the third type of the first epitaxy layer, said third type of the first epitaxy layer being on said second
25 type epitaxy layer, and after passing through said reaction time, said substrate being removed from the third

chamber, then, put into the fourth chamber, and further, said second substrate being removed to said third chamber;

forming the fourth type of the first epitaxy layer, said fourth type of the first epitaxy layer being positioned on said third type epitaxy layer, and after passing through said reaction time, said substrate being removed from said fourth chamber, and then, removed to the fifth chamber, and further, said second substrate being removed to the said fourth chamber; and

forming the second epitaxy layer, said second epitaxy layer being on said fourth type epitaxy layer, and after passing through said reaction time, said substrate being removed from said fifth chamber, and the second substrate being removed to said fifth chamber, and said reaction time being the growth time of the second epitaxy layer, and said substrate through in-out processing between multiple chambers implementing multiple epitaxy layers of multiple LEDs.

9. The method of the chemical metal organic vapor epitaxy for the multi-chamber epitaxy layer deposition according to claim 8, wherein said reaction time can be one hour.

10. The method of the chemical metal organic vapor epitaxy for the multi-chamber epitaxy layer deposition according to claim 8, wherein said first epitaxy layer can be N-type epitaxy layer.

11. The method of the chemical metal organic vapor epitaxy for the multi-chamber epitaxy layer deposition according to claim 8, wherein said second epitaxy layer can be a P-type epitaxy layer.
- 5 12. The method of the chemical metal organic vapor epitaxy for the multi-chamber epitaxy layer deposition according to claim 8, wherein the reaction condition of said chamber at least includes a carrier gas, a precursor, and a tolerated temperature range.
- 10 13. The method of the chemical metal organic vapor epitaxy for the multi-chamber epitaxy layer deposition according to claim 12, wherein said carrier gas can be H, and said precursor can be one of BC13 and PC13, BC13 and PH13, and NH3.
- 15 14. An apparatus of the chemical organic vapor epitaxy for the multi-chamber epitaxy layer deposition is used in the epitaxy layer of the LED process, comprising:
multiple chambers, which said multiple chambers are arranged along the periphery;
20 multiple supporting bases, which said supporting bases is used for supporting a substrate, and said supporting substrates are individually positioned in said multiple chambers; and
a pick-up apparatus, said pick-up apparatus being
25 positioned in the center of the said circle, and also, it comprising at least one robotic arm and a rotated

chassis, and it uses said rotated chassis to shift said robotic arm, then, using said robotic arm to pick up said substrate, and therefore, said substrate changing between said multiple chambers.

- 5 15. The apparatus of the chemical metal organic vapor epitaxy for the multi-chamber epitaxy layer deposition according to claim 14, wherein the numbers of said chamber is equal to the required reaction time of said first epitaxy layer divide to the required
10 reaction time of said second epitaxy layer, and more, it uses integral part of the number.